

International Journal of Group Tensions, 29, 219–251.

<https://doi.org/10.1023/A:1026521211796>

- Thapan, M. (2022). Dalit Autobiographies as Counter Publics: An Exploratory Essay. *South Asia Multidisciplinary Academic Journal*, 28. <https://doi.org/10.4000/samaj.7910>
- Sarangapani, P. (2003). Childhood and Schooling in an Indian Village. *Childhood*, 10(4), 403–418. doi:10.1177/0907568203104002.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

**DISCIPLINE SPECIFIC ELECTIVE
DSE HH 5B1: Nutritional Biochemistry I**

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Nutritional Biochemistry I	4	2	0	2	XII Pass	Appeared in Physical Science for Home Science

Learning Objectives

- To provide basic concepts of biomolecules, the basic building blocks vital for various life forms
- To focus on key structures, properties and biological functions of biomolecules

Learning Outcomes

- Gain knowledge on structure-function relationship of biomolecules
- Developing an insight into biochemical role and significance of carbohydrates, proteins, lipids, nucleic acids, vitamins and minerals

SYLLABUS OF HH 5B1

**THEORY
(Credits 2; Hours 30)**

UNIT I: Carbohydrates

6

Hours

This unit lays emphasis on classification, structures and properties of carbohydrates.

- Introduction, definition and classification

- Structures of monosaccharides (glucose, fructose, galactose, ribose) and disaccharides (maltose, lactose, sucrose)
- Homopolysaccharides-structures and functions (dextrin, starch, glycogen)
- Stereoisomerism of monosaccharides (Keto-aldo, D- and L-isomerism, optical isomerism, epimerism, anomerism), mutarotation

UNIT II: Lipids

6 Hours

This unit highlights on classification, structures and biochemical functions of fatty acids and lipids.

- Introduction and structure of fatty acids (saturated and unsaturated)
- Essential and non-essential fatty acids
- Definition, classification and function of lipids (storage lipids-triacylglycerols; Membrane lipids-phospholipids and sphingolipids)

UNIT III: Amino acids and Proteins

5 Hours

This unit covers structures and classification of amino acids. The unit also discusses basic concepts of structural organization in proteins.

- Introduction, definition, classification and structure of standard amino acids
- Essential and non-essential amino acids
- Peptide bond-nature, conformation and dihedral angles psi and phi
- Structure of proteins-primary, secondary (alpha-helix, beta-sheets and beta-turns), tertiary and quaternary

UNIT IV: Nucleic Acids

6 Hours

The unit focuses on structures, biological functions and significance of nucleic acids.

- Introduction and structure of nucleosides and nucleotides
- DNA structure (B-form) and functions
- RNA structure and functions (mRNA, tRNA and rRNA)

UNIT V: Vitamins and Minerals

7 Hours

This unit covers structures and biochemical functions of vitamins along with biological role and significance of minerals.

- Definition and classification of vitamins
- Structure and biochemical role of fat soluble vitamins-A and D
- Structure and biochemical role of water soluble vitamins- Thiamine, Riboflavin, Niacin, Pyridoxine and Ascorbic acid.
- Biological role and occurrence of inorganic elements – iron, calcium, phosphorous, iodine, selenium and zinc.

PRACTICAL (Credits 2; Hours 60)

1. Qualitative tests for monosaccharides, disaccharides and polysaccharides.
2. Identification of monosaccharides, disaccharides and polysaccharides in unknown mixtures.
3. Quantitative estimation of glucose, sucrose and lactose by titrimetric method.
4. Qualitative tests for amino acids.
5. Qualitative analysis of DNA by diphenyl amine reagent.
6. Qualitative analysis of RNA by orcinol reagent.

7. Estimation of ascorbic acid using 2,6 dichlorophenol indophenol method in the given solution.
8. Estimation of calcium using EDTA by titration.

Essential Readings:

- Kennelly, P. J., Botham, K. M., McGuinness, O., Rodwell, V. W., Weil, P.A., 2022, *Harper's Illustrated biochemistry* (32nd ed.). McGraw-Hill Education.
- Nelson, D. L., Cox, M. M., 2017, *Lehninger Principles of Biochemistry* (7th ed.). W H Freeman & Co.
- Satyanarayana, U., Chakrapani U., 2021, *Biochemistry* (6th ed.). Elsevier.
- Sundararaj, P., Siddhu, A., 2002, *Qualitative tests and Quantitative Procedures in Biochemistry* (2nd ed.). New Delhi: A. H. Wheeler and Co Ltd.

Suggested Readings:

- Voet, D., Voet, J.G., 2012, *Principles of Biochemistry* (4th ed.). Wiley.
- Devlin, T.M. 2010, *Textbook of Biochemistry with Clinical Correlations* (7th ed.). New York, John Wiley-Liss.
- West, E.S., Todd, W.R., Mason, H.S., Bruggen J.T.V., 2017, *Textbook of Biochemistry* (4th ed.). Oxford & IBH.

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